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(54) PACKING MATERIAL FOR ELECTRONIC PARTS

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a packing material for an electronic part case which is excellent in workability, strength, having high adherence with an aluminum foil and a resin layer, excellent in a steam transmission resistance, heat seal properties,

and is prevented from being damaged by electrolyte, and to provide an electric cell using the packing material.

SOLUTION: In the packing material for the electric cell for which a heat resistant resin oriented film layer, an aluminum foil layer and a thermoplastic resin unoriented film layer in order from the external layer are essential, packing material for case of electronic parts such as an electric cell or a capacitor or the like in which an acrylic polymer layer having at least one kind of organic base selected from a hindered amin group, a cycloalkyl group and a benzotriazole group is provided between the aluminum layer and the unoriented film layer. A lithium cell employs the case formed by deep drawing or bulging molding of the packing material for the electronic part case.

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CLAIMS

[Claim(s)]

[Claim 1] The wrapping material for electronic-parts cases which comes to prepare an acrylic polymer layer in order between an aluminum foil layer and an unstretched film layer in the wrapping material for electronic-parts cases which makes indispensable a heat-resistant-resin oriented film layer, an aluminum foil layer, and a thermoplastics unstretched film layer from an outer layer.

[Claim 2] The wrapping material for electronic-parts cases according to claim 1 whose polymer of an acrylic polymer layer is a polymer which has at least a kind of organic radical chosen from a hindered amine radical, a cycloalkyl radical, and a benzotriazol radical.

[Claim 3] The wrapping material for electronic-parts cases according to claim 1 or 2 whose polymer of an acrylic polymer layer is a polymer which carried out isocyanate bridge formation of the acrylic polyol.

[Claim 4] The wrapping material for electronic-parts cases given in any 1 term of claims 1-3 using O material with a thickness [of a pure aluminium system or an aluminum-iron system alloy] of 7-100 micrometers as an aluminum foil layer.

[Claim 5] The wrapping material for electronic-parts cases given in any 1 term of claims 1-4 using the oriented film of a polyamide with a thickness of 9-50 micrometers or polyester as a heat-resistant-resin oriented film layer.

[Claim 6] For a heat-resistant-resin oriented film, the tensile strength of four directions (0 degree, 45 degrees, 90 degrees, 135 degrees) is 2 150Ns/mm. Wrapping material for electronic-parts cases according to claim 5 whose **** elongation is 80% or more above.

[Claim 7] The wrapping material for electronic-parts cases given in any 1 term of claims 1-6 at least using a kind of thermoplastics unstretched film chosen from polyethylene, polypropylene, olefin system copolymers, those acid denaturation objects, or an ionomer as a thermoplastics unstretched film layer.

[Claim 8] The wrapping material for electronic-parts cases given in claim 1 whose electronic-parts case is a cell case or a capacitor case thru/or any 1 term of 7.

[Claim 9] The lithium cell which comes to use for claim 1 thru/or any 1 term of 7 the case which fabricated the wrapping material for electronic-parts cases of a publication by deep-drawing shaping or stretch forming [claim 10] The capacitor which comes to use for claim 1 thru/or any 1 term of 7 the case which fabricated the wrapping material for electronic-parts cases of a publication by deep-drawing shaping or stretch forming.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the cell fabricated by the case of a lithium ion battery and a high performance secondary battery like a polymer battery where it had the case, especially the lightweight and small high energy consistency for electronic parts, using the wrapping material for electronic-parts cases and it excellent in usable waterproof steamy permeability, electrolytic-solution-proof permeability, a moldability, heat-sealing nature, etc.

[0002]

[Description of the Prior Art] In recent years, in OA field, memory also especially has development of memory card further to the notebook mold from a desktop mold, and a notebook type like a personal computer by miniaturization, lightweight-izing, and thin shape-ization progressing, as for electronic equipment, such as a voice device and a visual equipment, and remarkable expansions, such as connection-izing with a cellular phone, are being performed also for these. Improvement in high-performance-izing, lightweight-izing, and migratory ability is demanded for the secondary battery for these electronic equipment, the capacitor, etc. with the miniaturization of such electronic equipment, and lightweight-izing. In order to reply to such a request, it changes to the lithium cell which has a high energy consistency from the conventional lead accumulator further to a nickel-cadmium battery also in a secondary battery, and a rechargeable lithium-ion battery, a nickel-hydrogen rechargeable battery, etc. become the mainstream, and, as for current, the development is performed quickly. The high volume energy density and high current charge and discharge it is supposed that can furthermore be used also for the power source of a hybrid car, an electric double layer capacitor strong against a charge-and-discharge cycle, etc. are being put in practical use.

[0003] It will be used secondary ****** needing to perform discharge and charge, and repeating such ** and discharge. In this case, since the electrolytic solution, an organic solvent, etc. which are used by mixing of moisture etc. at the time of charge cause hydrolysis or there is a problem of oxygen and moisture invading from the open air, deteriorating positive active material, a negative-electrode active material, a conductive polymer, etc., and decomposing, it is required that the sealing nature of the electronic-parts case itself should be maintained very highly. Moreover, there is the same demand also in electronic parts, such as an electric double layer capacitor which uses a nonaqueous electolyte. Since the demand of such lightweight nature and sealing nature is met, what uses the laminate material of thermoplastics-aluminium foil for the wrapping material for electronic-parts cases can see. For example, there is a proposal of

the wrapping material for electronic-parts cases which used the resin film which covered the aluminum thin film with the resin film to JP,59-173944,A, or put the aluminum thin film, and JP,8-83596,A has the proposal which uses the lamination of polyethylene / aluminum / polyethylene as an wrapping material for thin card cells.
[0004] Moreover, JP,9-213285,A has the proposal of the wrapping material for electronic-parts cases which processed into tubed the sheet plastic of the multilayer structure which has the aluminum foil layer of at least one layer as an internal layer. furthermore -- JP,10-157008,A -- polyethylene / aluminium foil / hot melt / extension -- polyester -- the laminate film of a configuration is indicated and the proposal which carries out thermoforming of this laminate film, and is used as a cell case is made. In addition, it is supposed that it is desirable to use the extension polyester film of copolymerized polyester with good thermoforming nature as for the polyester film used here.
[0005] However, an wrapping material given in JP,59-173944,A It is what carried out thermocompression bonding of the end face of the laminate material which put both sides of aluminium foil with a thickness of 20 microns in the polyethylene layer with a thickness of 100 microns according to the example. A seal is what is joined with heat sealing of wrapping materials. Moreover, an wrapping material given in JP,8-83596,A the wrapping material for thin card electronic-parts cases -- it is -- the big closure section (the interior of a cell -- air --) in the periphery section of the generation-of-electrical-energy element of a cell In order that the area and the volume which these closure sections, such as needing the part which is heat sealing sheathing materials, occupy may account for a big rate to the whole cell so that moisture may not invade, becoming raising the volume energy density of a cell with a failure is not avoided.
[0006] moreover , after an wrapping material given in JP,9-213285,A process an aluminum laminate material into tubed , a generation of electrical energy element be insert , in the point which carry out the seal of the opening of the upper part and the lower part with heat sealing or adhesives , a closure aspect product be mostly write small to one half extent , and although volume energy density be carry out improvement sharply as compared with the aforementioned wrapping material for thin card electronic parts cases , it must be say that it be still inadequate . Furthermore, it is constituted on the assumption that thermoforming of the wrapping material given in JP,10-157008,A is carried out, since polyethylene is used for the inside film, it is difficult to satisfy the elevated-temperature retention test (safety test) of the cell by which the bond strength in an elevated temperature is demanded, and the polyester film for fabrication makes copolymerization polyester film desirable for thermoforming. On the other hand, since it not only carries out a heat shrink at the time of thermoforming, but an adhesive property is inferior in extension polyester film and adhesive strength declines with the usual adhesives for dry laminates, there are problems -- it is made indispensable to use

hot melt system adhesives.

[0007] Moreover, development of the ingredient aiming at lightweight-izing of that it was the aluminum case which prepared vinyl-chloride-resin covering conventionally using thermoplastic Nylon lamination-aluminum material (JP,08-001857,A) and thermoplastic polyester resin paint aluminum material (JP,09-275043,A) etc., and the formation of vinyl-chloride-resin un-using it is progressing. Furthermore, the proposal (JP,2001-011658,A) of the capacitor case material which prepared the chemical film in the split-face inferior surface of tongue of the aluminum which carried out surface roughening of the front face, and prepared the organic resin coat on this coat further is also made.

[0008] In order to consider as a cell with the high volume energy density which can be used in the miniaturization of electronic equipment, and the thin-shape-ized electronic equipment case, it doubles with the narrow space formed in the remainder with which the components of a printed circuit board and others etc. were filled up, and the configuration of electronic-parts cases, such as a cell case with which there is no dead space and it can be filled up, or a capacitor case, is required. for this reason -- being alike -- since it is necessary with a thin shape to consider as the cell case of a sharp configuration on the whole, an aluminium foil laminate material is thin meat as much as possible, and the wrapping material whose shaping of a sharp configuration is attained is needed. If it sees from such a viewpoint, the ingredient for the cell cases of the above-mentioned conventional technique is the configuration of polyethylene (100 micrometers) / aluminum (20 micrometers) / polyethylene (100 micrometers), or polypropylene (100 micrometers) / aluminum (20 micrometers) / polypropylene (100 micrometers), these cannot be said to be an ingredient with a sufficient moldability, but use will be impossible if it remains as it is.

[0009] There is also a proposal of the wrapping material for electronic-parts cases which consists of a heat-resistant-resin oriented film / aluminium foil / polyolefine, acid denaturation polyolefine, or ionomer resin from a front face in order to make thickness of an wrapping material thin and to consider as the case of a sharp configuration, raising the reinforcement of an wrapping material on the other hand, and improving the workability. Although this wrapping material for electronic-parts cases was thin, and the moldability was good and was what solved most above-mentioned troubles, in the case of polyolefin resin, there are problems, like an adhesive property with aluminium foil is weak, and this improvement was needed for the being [risk of polyolefine, acid denaturation polyolefine, or ionomer resin not preventing osmosis of the nonaqueous electrolyte of a lithium cell certainly, but aluminium foil being invaded] list. The same problem was required also in the capacitor case which uses nonaqueous electrolyte.

[00010]

[Problem(s) to be Solved by the Invention] This invention is excellent in the workability of stretch forming, deep-drawing shaping, etc., and shaping of a sharp configuration is

possible for it. Excel also in reinforcement and the adhesive property of aluminium foil and a resin layer is also high. It is small [which used the wrapping material for electronic-parts cases and it which are excellent in waterproof steamy permeability and heat-sealing nature, and are not invaded by the corrosive electrolytic solution etc.]. It aims at development of the cell case for the wrapping material for electronic-parts cases for ****** with high volume energy density, a capacitor, etc. and the cell using it, or a capacitor.

[0011]

[Means for Solving the Problem] As a result of inquiring wholeheartedly that this invention persons should attain the above-mentioned purpose, the purpose is attained by preparing an acrylic polymer layer between an aluminum foil layer and an unstretched film layer, and the polymer which has at least one sort of organic radicals chosen from the hindered amine radical, cycloalkyl radical, and benzotriazol radical which have further specific structure came to complete a header and this invention for doing remarkable effectiveness so. Namely, this invention [1] Wrapping material for electronic-parts cases which comes to prepare an acrylic polymer layer in order between an aluminum foil layer and an unstretched film layer in the wrapping material for electronic-parts cases which makes indispensable a heat-resistant-resin oriented film layer, an aluminum foil layer, and a thermoplastics unstretched film layer from an outer layer.

[0012] The polymer of an acrylic polymer layer [2] A hindered amine radical, The wrapping material for electronic-parts cases given in the above [1] which is the polymer which has at least a kind of organic radical chosen from a cycloalkyl radical and a benzotriazol radical, [3] The above [1] whose polymer of an acrylic polymer layer is a polymer which carried out isocyanate bridge formation of the acrylic polyol, or wrapping material for electronic-parts cases given in [2] [4] As an aluminum foil layer Wrapping material for electronic-parts cases given in either of above-mentioned [1] - [3] using O material with a thickness [of a pure aluminium system or an aluminum-iron system alloy] of 7-100 micrometers [5] As a heat-resistant-resin oriented film layer The wrapping material for electronic-parts cases given in either of above-mentioned [1] - [4] using the oriented film of a polyamide with a thickness of 9-50 micrometers or polyester, [0013] [6] For a heat-resistant-resin oriented film, the tensile strength of four directions (0 degree, 45 degrees, 90 degrees, 135 degrees) is 2 150Ns/mm. Above, Wrapping material for electronic-parts cases given in above-mentioned [5] claim 5 whose **** elongation is 80% or more [7] As a thermoplastics unstretched film layer The wrapping material for electronic-parts cases given in either of above-mentioned [1] - [6] at least using a kind of thermoplastics unstretched film chosen from polyethylene, polypropylene, olefin system copolymers, those acid denaturation objects, or an ionomer, [0014] [8] The above [1] whose electronic-parts case is a cell case or a capacitor case thru/or the wrapping material for electronic-parts cases given in either of

[7], [9] The wrapping material for electronic-parts cases the above [1] thru/or given in either of [7] The lithium cell which comes to use the case fabricated by deep-drawing shaping or stretch forming, And [10] The above-mentioned technical problem was solved by developing the capacitor which comes to use for the above [1] thru/or either of [7] the case which fabricated the wrapping material for electronic-parts cases of a publication by deep-drawing shaping or stretch forming.

[0015]

[Embodiment of the Invention] The wrapping material for electronic-parts cases of this invention is an wrapping material which has the engine performance processible by press-forming methods between the colds (ordinary temperature), such as overhang shaping or deep-drawing shaping. Although wrapping material total thickness is thin, reinforcement is high, and they are the fabricating methods (these fabricating methods are called "press-forming method" below.), such as overhang shaping or deep-drawing shaping. It is the aluminium foil laminate material by which was also set, and sharp shaping is possible, and adhesion of aluminium foil and a resin layer is trustworthy, waterproof steamy permeability and electrolytic-solution-proof permeability have been further improved, and generating of fracture by necking of aluminium foil was prevented at the time of shaping.

[0016] Although it is most suitable for the lithium ion battery, polymer battery, or nickel hydoride battery which uses the especially corrosive high electrolytic solution, and dislikes invasion of moisture or oxygen to the degree of pole as a target cell, also in a primary cell, a rechargeable battery, etc. which need the other lightweight-izing and a miniaturization, it is lightweight as an electronic-parts case, and when the moldability of a sharp configuration is required, the wrapping material for these electronic-parts cases can be used. Moreover, as a capacitor, it can be used as various electrolytic capacitors, especially an wrapping material for electric double layer capacitors which it is long lasting even if it is large-capacity-ized by leaps and bounds recently and repeats high volume energy density and rapid charge and discharge, and attracts attention as an energy source of low pollution.

[0017] Although there will be no limit especially if processible as the quality of the material of the aluminium foil used for the wrapping material for electronic-parts cases of this invention From the ease of press forming, preferably A pure aluminium system or an aluminum-iron system alloy, For example, 7-100 micrometers (elasticity material) of 15-80-micrometer O material are preferably used for AA-8021, AA-8079, and the barrier property reservation that prevents reservation of workability, and invasion into the case of oxygen or moisture as thickness. In the thickness of less than 7 micrometers, since it is easy to generate a pinhole etc. even when fracture of aluminium foil becomes easy to break out and does not fracture at the time of press forming, the danger of invasion of oxygen or moisture becomes high. Especially in the thickness exceeding 100 micrometers on the other hand, since it does not spread only by reducing the

volume energy density when using weight of a case as increase and a cell, as for the improvement effect of the fracture at the time of shaping thickening wrapping material total thickness more than this, since the pinhole generating prevention effectiveness is not necessarily improved, either, avoiding, although based also on the size of a case is desirable.

[0018] As for such aluminium foil, it is desirable to perform surface treatment of a chromium system and a non chromium system (for example, zirconium system) in order to improve an adhesive property with to raise chemical resistance and a resin film. In addition, in this aluminium foil, it is the purpose which raises lamination adhesive property ability with a resin film, and under coats, such as a silane coupling agent and a titanium coupling agent, or corona discharge treatment may be pretreated further.

[0019] In the wrapping material for electronic-parts cases, fracture by necking of the aluminium foil at the time of shaping is prevented, and it is thin meat, and in order to fabricate a sharp configuration, it is required to laminate a heat-resistant-resin biaxially oriented film directly with dry lamination adhesives etc. at least on one side of aluminium foil. As heat resistant resin in this case, reinforcement is high, and elongation is large, and it is films, such as a polyamide (nylon) which is elasticity or polyester, polyimide, and polypropylene, and using a biaxial-stretching polyamide film preferably. This polyamide film or polyester film has reinforcement and high elongation, and what has few directivity is desirable. By laminating directly in aluminium foil by making this polyamide film or polyester film into outer layer material, necking of the aluminium foil at the time of shaping can be controlled effectively, and it becomes possible to acquire the Plastic solid of a deep and sharp configuration.

[0020] As thickness of the film in this case, 9-50-micrometer 12-30 micrometers are preferably required. They are a lifting and a cone in poor shaping according [when performing sharp shaping in less than 9 micrometers, the elongation of an oriented film runs short and produce necking in aluminium foil, and] to aluminium foil fracture. By the thickness exceeding 50 micrometers on the other hand, though the reinforcement of configuration maintenance improves, especially, the effectiveness of the moldability of fracture prevention or a sharp configuration does not necessarily improve, and volume energy density is only reduced.

[0021] For this heat-resistant-resin oriented film, the tensile strength of four directions (0 degree, 45 degrees, 90 degrees, and 135 degrees) is 2 150Ns/mm. It is 2 200Ns/mm preferably above. The **** elongation of a **** and four directions uses above what has a machine nature property which has 100% or more preferably 80% or more. When using such a heat-resistant oriented film, sharp shaping can be performed even if it is not a copolymerization film. Especially the tensile strength of four directions is 2 200Ns/mm. Above, when **** elongation uses 100% or more of heat-resistant-resin oriented film, a more sharp configuration can stabilize and fabricate.

[0022] The tensile strength of the direction of either is 2 150Ns/mm among the four

directions of these heat-resistant-resin oriented film. When it is the following or the elongation of the direction of either is less than 80% among four directions, the tear of an wrapping material (fracture of aluminium foil) may arise in the mold-goods corner section at the time of shaping of a sharp configuration. Among these heat-resistant-resin oriented films, since elongation is large as compared with polyester film, when carrying out press forming of the cell case of the configuration where shaping height is more deep, the polyamide film of the polyamide film is more advantageous. It is laminating little polyamide film or polyester film of directivity of a mechanical property directly in aluminium foil with urethane system dry laminate adhesives in this invention, and finds out that shaping sharp enough is attained with cold pressing shaping (an overhang or deep-drawing shaping).

[0023] Moreover, thermoplastics unstretched films (these films "are called unstretched film etc." below.), such as polyethylene used as inner layer material of the wrapping material for electronic-parts cases, polypropylene, maleic-acid denaturation polypropylene, an ethylene-acrylate copolymer, or ionomer resin, give heat-sealing nature to raising the chemical resistance to the electrolytic solutions, such as a powerful corrosive rechargeable lithium-ion battery, etc., and an wrapping material, and it is used for them in order to maintain the sealing performance of a case.

[0024] as this thermoplastics unstretched film etc. -- polyethylene (high density --) semi-gross density, low density polyethylene, or a line -- a copolymer with low density polyethylene and a small amount of alpha olefin is included :P E -- Polypropylene (little ethylene and a copolymer with other polymerization nature monomers are also included-P), Denaturation polypropylene (denaturation PP), or the ethylene and the acrylic acid by denaturation polyethylene (denaturation PE), a maleic anhydride, etc. by a maleic anhydride etc., Unstretched films, such as a copolymer (EAA) with acrylic ester, ionomer resin, or those blend constituents, etc. are used. It is required to laminate this through an acrylic polymer layer in aluminium foil. In this case, high PP of the environmental condition used as a cell to thermal resistance and Denaturation PP are desirable. moreover, the fluid point at the time of heat sealing to as opposed to [when using it as a capacitor] a terminal -- a line -- low density polyethylene is desirable.

[0025] Since hot seal reinforcement is high, and these PP(s), Denaturation PP, and EAA resin have little possibility of causing faults, such as leakage in the elevated-temperature retention test (safety test) of a cell, bulging, and a burst, they are excellent. From a viewpoint of the safety in an elevated temperature, polypropylene (melting point of 140-170 degrees C) is most excellent. On the other hand, Denaturation PE, Denaturation PP and EAA, or three sorts of resin of ionomer resin has a good adhesive property [as opposed to a metal (terminal) as compared with polyethylene, polypropylene etc.], and, for this reason, there is little risk, such as delamination.

[0026] Therefore, when importance is attached to elevated-temperature safety and the adhesive balance to safety and a metal is needed for PP, it is desirable to choose and

laminate Denaturation PE, Denaturation PP and EAA, or ionomer resin. Both these resin gives heat-sealing nature to an wrapping material while satisfying chemical resistance (electrolytic-solution-proof nature) and configuration maintenance nature (rigidity).

[0027] As thickness of these unstretched films, 10-70 micrometers of thickness of 20-55 micrometers are preferably required. By the thickness of less than 10 micrometers, there is risk of the thickness after fabricating being thin, becoming easy to generate a pinhole, and the corrosion resistance over the electrolytic solution etc. falling. Since chemical resistance and heat-sealing nature do not necessarily improve even if it uses the film of the thickness exceeding 70 micrometers on the other hand, volume energy is only fallen.

[0028] As a result of inquiring wholeheartedly that the above-mentioned purpose should be attained, it is preparing an acrylic polymer layer between an aluminum foil layer and an unstretched film layer, and the purpose is attained, the polymer which has at least one sort of organic radicals chosen from the hindered amine radical, cycloalkyl radical, and benzotriazol (ultraviolet absorption nature) radical which have further specific structure finds out that remarkable effectiveness is shown, and an invention-in-this-application person etc. came to complete this invention. This invention is to offer the wrapping material for electronic-parts cases excellent in steam permeability, electrolytic-solution-proof permeability, a moldability, heat-sealing nature, etc.

[0029] The polymer of the acrylic polymer layer prepared between an aluminum foil layer and an unstretched film layer in this invention carries out the polymerization of the component which contains an acrylic (meta) monomer more than 50 mass %, and is obtained. (Meta) It is still more desirable that an acrylic monomer is included more than 80 mass %.

[0030] As a polymerization nature monomer, an acrylic-acid (meta) alkyl ester monomer, A hydroxyl-group content polymerization nature monomer, a polymerization nature unsaturated-carboxylic-acid monomer, a sulfonic group content polymerization nature monomer, An alkyl-acid-phosphate system polymerization nature monomer, an epoxy group content polymerization nature monomer, A nitrogen content polymerization nature monomer, a halogen content polymerization nature monomer, an aromatic series system polymerization nature monomer, Vinyl ester, vinyl ether, a cyano group content polymerization nature monomer, a silicon system monomer, an isocyanate radical content monomer, a polyfunctional monomer, other monomers, etc. can be mentioned, and at least one sort chosen from these groups is used.

[0031] (Meta) As an acrylic-acid alkyl ester monomer Cyclohexyl (meta) acrylate, methylcyclohexyl (meta) acrylate, Cycloalkyl radical content monomers, such as tertiary butyl cyclohexyl (meta) acrylate and cyclo dodecyl (meta) acrylate, Methyl acrylate, ethyl acrylate, n-butyl acrylate, Isobutyl acrylate, tert-butyl acrylate, sec-butyl acrylate, n-propylacrylate, isopropyl acrylate, isoamyl acrylate, 2-ethylhexyl acrylate,

isodecyl acrylate, tridecyl acrylate, n-octyl acrylate, iso octyl acrylate, n-laurylacrylate, Benzyl acrylate, dicyclopentanil acrylate, n-stearyl acrylate, Isostearyl acrylate, isobornyl acrylate, 2-(aceto acetoxy) ethyl acrylate, Phenoxy ethyl acrylate, methyl methacrylate, ethyl methacrylate, N-butyl methacrylate, isobutyl methacrylate, tert-butyl methacrylate, sec-butyl methacrylate, n-propyl methacrylate, isopropyl methacrylate, Isoamyl methacrylate, 2-ethylhexyl methacrylate, isodecyl methacrylate, Tridecyl methacrylate, n-octyl methacrylate, iso octyl methacrylate, n-lauryl methacrylate, benzyl methacrylate, dicyclopentanil methacrylate, n-stearyl methacrylate, isostearyl methacrylate, isobornyl methacrylate, 2-acetoacetoxylethylmethacrylate (a trade name AAEM, Eastman), phenoxy ethyl methacrylate, etc. can be mentioned.

[0032] As an acrylic monomer which has a hydroxyl group, for example 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 3-hydroxypropyl acrylate, 2-hydroxy butyl acrylate and 4-hydroxy butyl acrylate (a trade name -- 4 HBA) Mitsubishi Chemical, alpha-hydroxymethyl ethyl acrylate, alpha-hydroxymethyl acrylate, caprolactone denaturation hydroxy acrylate (trade name plaque cel F series --) The Daicel Chemical Industries, Ltd. make, 2-hydroxyethyl methacrylate, 2-hydroxypropyl methacrylate, 3-hydroxypropyl methacrylate, 2-hydroxy butyl methacrylate, 4-hydroxy butyl methacrylate, caprolactone denaturation hydroxy methacrylate (trade name plaque cel F series, Daicel Chemical Industries, Ltd. make), etc. can be mentioned.

[0033] As a monomer which has an acid functional group, an acrylic acid, a methacrylic acid, A maleic acid, a fumaric acid, a crotonic acid, an itaconic acid, a maleic anhydride, carboxyl group end caprolactone denaturation acrylate and carboxyl group end caprolactone denaturation methacrylate (trade name plaque cel FMA series --) The Daicel Chemical Industries, Ltd. make, sulfoethyl acrylate, sulfoethyl methacrylate, 2-acryloyloxyethyl acid phosphate, 2-methacryloiloxy-ethyl acid phosphate, 2-acryloyloxypropyl acid phosphate, 2-methacryloyl oxypropyl acid phosphate, etc. can be mentioned.

[0034] As vinyl ester, they are vinyl acetate, butanoic acid vinyl, caproic-acid vinyl, caprylic-acid vinyl, capric-acid vinyl, lauric-acid vinyl, myristic-acid vinyl, palmitic-acid vinyl, stearic acid vinyl, cyclohexane-carboxylic-acid vinyl, vinyl pivalate, octylic acid vinyl, monochloroacetic acid vinyl, an adipic-acid divinyl, methacrylic-acid vinyl, and crotonic-acid BINI. RU, sorbic-acid vinyl, benzoic-acid vinyl, cinnamic acid vinyl, etc. can be mentioned.

[0035] As a silane compound monomer, vinyl trichlorosilan, a vinyl tris (beta-methoxyethoxy) silane, Vinyltriethoxysilane, vinyltrimetoxysilane, gamma-methacryloxpropyl trimethoxy silane, A trimethylsiloxy ethyl methacrylate halogen, trifluoroethyl acrylate, Tetrafluoropropylacrylate, octafluoropentyl acrylate, Hepta-dodeca fluoro decyl acrylate, beta-(perphloro octyl) ethyl acrylate, Trifluoroethylmethacrylate, tetrafluoro propyl methacrylate, Hexafluoro propyl methacrylate, octafluoropentyl methacrylate, HEPUTADO decafluoro DESHIRU

methacrylate, beta-(perphloro octyl) ethyl methacrylate, tribromophenol 3EO addition methacrylate, TORIBUROMO phenyl methacrylate, etc. can be mentioned.
[0036] Perphloro octylethylacrylate, perphloro octylethylmethacrylate, etc. can be mentioned as a monomer containing a fluorine atom.
[0037] As a nitrogen content polymerization nature monomer, it is 4-(meth)acryloyloxy. - 2, 2, 6, and 6-tetramethylpiperidine, 4-(meth)acryloyloxy - 1, 2, 2, 6, and 6-pentamethylpiperidine, 4-(meta) acryloylamino - 2, 2, 6, and 6-tetramethylpiperidine, 4-(meta) acryloylamino - 1, 2, 2, 6, and 6-pentamethylpiperidine, 4-cyano-4-(meta) acryloylamino - 2, 2, 6, and 6-tetramethylpiperidine, 4-KUROTO noil oxy-- 2, 2, 6, and 6-tetramethylpiperidine, 4-KUROTO noil amino - 2, 2, 6, and 6-tetramethylpiperidine, 1-(meta) acryloyl-4-(meta) acryloylamino - 2, 2, 6, and 6-tetramethylpiperidine, 1-(meta) acryloyl-4-cyano-4-(meta) acryloylamino - 2, 2, 6, and 6-tetramethylpiperidine, 1-KUROTO noil-4-KUROTO noil oxy-- as reactivity HALS of 2, 2, 6, and 6-tetramethylpiperidine and marketing Hindered amine radical content monomers, such as ADEKA stub LA-82, ADEKA stub LA-87 (Asahi Denka Kogyo K.K. make), FA-711MM, and FA-712HM (Hitachi Chemical Co., Ltd. make);
[0038] 2-[2'- hydroxy-5'-(meta) acryloyloxyethyl phenyl]-2H-benzotriazol, 2-[2'-hydroxy-5'-(meta) acryloyloxypropyl phenyl]-2H-benzotriazol, 2-[2'-hydroxy-5'-(meth)acryloyloxy hexyl phenyl]-2H-benzotriazol, 2-[2'-hydroxy-3 '-tert-butyl -5'-(meta) acryloyloxyethyl phenyl]-2H-benzotriazol, 2-[2'-hydroxy-3 '-tert-butyl -5'-(meta) acryloyloxyethyl phenyl]-5-chloro-2H-benzotriazol, 2-[2'-hydroxy-5 '-tert-butyl -3'-(meta) acryloyloxyethyl phenyl]-2H-benzotriazol, 2-[2'-hydroxy-5'-(meta) acryloyloxyethyl phenyl]-5-chloro-2H-benzotriazol, 2-[2'-hydroxy-5'-(meta) acryloyloxyethyl phenyl]-5-methoxy-2H-benzotriazol, 2-[2'-hydroxy-5'-(meta) acryloyloxyethyl phenyl]-5-cyano-2H-benzotriazol, 2-[2'-hydroxy-5'-(meta) acryloyloxyethyl phenyl]-5-t-butyl-2H-benzotriazol, Benzotriazol radical content monomers, such as 2-[2'-hydroxy-5'-(beta-methacryloyl oxyethoxy)-3'-tert-buthylphenyl]-4-tert-butyl-2H-benzotriazol;
[0039] Acrylamide, t-butyl acrylamide, methylenebis acrylamide, Methoxymethyl acrylamide, ethoxymethyl acrylamide, butoxy methylacrylamide, Methylol acrylamide, methacrylamide, methylenebis methacrylamide, Methylol methacrylamide, N-isopropyl acrylamide, N-methylol acrylamide, N-methoxymethyl acrylamide, N-butoxy methylacrylamide, Diacetone acrylamide, N,N-dimethylaminopropyl acrylamide, acrylamide;2-METAKURO yloxy ethyl isocyanates (the trade name currant MOI --), such as N-phenyl maleimide, N-cyclohexyl maleimide, and 2-isopropenyl-2-oxazoline Showa Denko K.K., METAKU roil isocyanate (a trade name MAI and Nippon Paint Co., Ltd.), m-isopropenyl - Isocyanate radical content monomers, such as alpha and alpha dimethylbenzyl isocyanate (trade name m-TMI and Takeda Chemical Industries, Ltd.);
[0040] Imide acrylate, imide methacrylate, dimethylamino ethyl acrylate,

Dimethylaminoethyl methacrylate, diethylamino ethyl acrylate, Diethylamino ethyl methacrylate, the 4th class ghost of dimethylamino ethyl acrylate, The 4th class ghost of dimethylaminoethyl methacrylate, methacryloiloxy-ethyl trimethylammonium chloride, A dimethylaminoethyl methacrylate sulfate, morpholine EO addition methacrylate, N-vinylpyridine, N-vinyl imidazole, N-vinyl pyrrole, N-vinyl-pyrrolidone, N-vinyl oxazolidone, N-vinyl SAKUSHIN imide, N-vinyl methyl KARUPE mate, N, and N-methylvinyl acetamide etc. can be mentioned.

[0041] As a polyfunctional polymerization nature monomer, ethylene glycol diacrylate, Diethylene glycol diacrylate, triethylene glycol diacrylate, Polyethylene-glycol #200 diacrylate, polyethylene-glycol #400 diacrylate, Polyethylene-glycol #600 diacrylate, polyethylene-glycol #1000 diacrylate, 13-butylene-glycol diacrylate, 14-butanediol diacrylate, 1,6-hexanediol diacrylate, 1, 9-nonane diol diacrylate, Neopentyl glycol diacrylate, polypropylene-glycol #400 diacrylate, EO denaturation trimethylolpropane triacrylate, a pentaerythritol thoria chestnut rate, Pentaerythritol tetraacrylate, dipentaerythritol hexaacrylate, Tris acryloyloxyethyl phosphate, ethylene glycol dimethacrylate, Diethylene-glycol dimethacrylate, polyethylene-glycol #200 dimethacrylate, Polyethylene-glycol #400 dimethacrylate, polyethylene-glycol #600 dimethacrylate, 14-butanediol dimethacrylate, 1, 6-hexanedioldimethacrylate, Neopentyl glycol dimethacrylate, polypropylene-glycol #400 dimethacrylate, Glycerol dimethacrylate, 2-hydroxy-13-JIMETAKURIROKISHI propane diacrylate, 2 and 2-screw [4-(meta-chestnut ROKISHI ethoxy) phenyl] propane diacrylate, 2 and 2-screw [4-(methacryloxydiethoxy) phenyl] propane diacrylate, 2 and 2-screw [4-(meta-KURIROKISHI poly ethoxy) phenyl] propane diacrylate EO denaturation bisphenol A diacrylate, PO denaturation bisphenol A diacrylate trimethylolpropane triacrylate, PO denaturation bisphenol A diacrylate trimethylolpropanetrimethacrylate, 2, and 2-screw [4-(methacryloxydiethoxy) phenyl] propane dimethacrylate etc. can be mentioned.

[0042] As vinyl ether, vinyl methyl ether, vinyl ethyl ether, Vinyl isopropyl ether, the vinyl isobutyl ether, vinyl-n-butyl ether, Vinyl-n-amyl ether, the vinyl isoamyl ether, the vinyl-2-ethylhexyl ether, The vinyl-n-octadecyl ether, the cyano methyl vinyl ether, 2 and 2-dimethylaminoethyl vinyl ether, 2-KURORU ethyl vinyl ether, beta-difluoromethyl vinyl ether, benzyl vinyl ether, phenyl vinyl ether, the divinyl ether, a divinyl acetal, etc. can be mentioned. .

[0043] As an epoxy group content polymerization nature monomer, glycidyl acrylate, alpha-methyl glycidyl acrylate, 3, 4-epoxycyclohexyl methylacrylate (trade name CYCLOMER A200, Daicel Chemical Industries, Ltd. make), glycidyl methacrylate, alpha-methyl glycidyl methacrylate (trade name M-GMA, Daicel Chemical Industries, Ltd. make), 3, and 4-epoxycyclohexyl methylmethacrylate (trade name CYCLOMER M100, Daicel Chemical Industries, Ltd. make) can be mentioned. As other monomers, the compound (Toagosei Chemical Industry Co., Ltd. make) of AS-6, AN-6, and AA-6

grade which are styrene, alpha methyl styrene, vinyltoluene, vinyl acetate, a vinyl chloride, a vinylidene chloride, and macromere can be mentioned.

[0044] In order to introduce a hindered amine radical into a polymer, said hindered amine radical content monomer is copolymerized. One sort of this hindered amine radical content monomer or two sorts or more are used on the occasion of a polymerization. In order to introduce a cycloalkyl radical into a polymer, one or more sorts of said cycloalkyl radical content monomer are copolymerized. In order to introduce a benzotriazol radical into a polymer, said benzotriazol radical content monomer is copolymerized. One sort of this benzotriazol radical content monomer or two sorts or more can be used.

[0045] The acrylic polymer layer which copolymerized the above-mentioned hindered amine radical content monomer gives the engine performance which strengthens an adhesive property with aluminium foil and an unstretched film. When the above-mentioned cycloalkyl radical content monomer is copolymerized, waterproof steamy permeability and a water resisting property are given to an acrylic polymer layer. Moreover, when the above-mentioned benzotriazol radical content monomer is copolymerized, waterproof steamy permeability and a water resisting property are given to an acrylic polymer layer. In addition, although especially the content of these monomers is not specified, as for the content ratio of each monomer component, it is desirable that the content of a hindered amine radical content monomer constitutes 100 % of the weight of polymers 0.1 to 10.0% of the weight in within the limits whose content of the polymerization nature monomer of 0.1 - 50.0 % of the weight and others the content of 5.0 - 97.8 % of the weight and a benzotriazol radical content monomer is 2.0 - 94.8 % of the weight for the content of a cycloalkyl radical content monomer.

[0046] In addition, if it is in the polymer of the acrylic polymer layer of this invention, for the good physical properties as a packing material for cells of this invention, it is desirable that it is the acrylic polymer which has the cycloalkyl radical obtained by carrying out a polymerization using the monomer component which contains a monomer with a cycloalkyl radical as a component at least. It is desirable that it is the acrylic polymer which has the cycloalkyl radical, hindered amine radical, and/or benzotriazol radical which were obtained by carrying out a polymerization using the monomer component which contains as a component the monomer which has a monomer with a cycloalkyl radical, a monomer with a hindered amine radical, and/or a benzotriazol radical still more preferably.

[0047] A polymer can be manufactured by carrying out the polymerization of the monomer mixture of the above-mentioned blending ratio of coal by the well-known polymerization method conventionally. Since it is obtained as a polymer solution which it becomes unnecessary to newly do the dissolution activity of a polymer on a solvent, and does not contain excessive components, such as a surfactant, in case it applies, when based on a solution polymerization method especially, it is desirable. As an

example of an organic solvent, the following are mentioned, for example and these one sort or two sorts or more may be used.

[0048] As an aromatic hydrocarbons solvent, toluene, a xylene, Solvesso 1000 (Maruzen Petrochemical Co., Ltd.), Solvesso 1500 (Maruzen Petrochemical Co., Ltd.), a mineral spirit ester solvent, ethyl acetate, n-propyl acetate, n-butyl acetate, isobutyl acetate, n-amyl acetate, ethylene glycol ethyl ether acetate (cellosolve acetate), and propylene-glycol-monomethyl-ether acetate (Kuraray, AKOSORUBU PMA) are mentioned. As ketones, an acetone, a methyl ethyl ketone, methyl isobutyl ketone, and a cyclohexanone are mentioned.

[0049] As an alcohols solvent, moreover, a methanol, ethanol, n-propyl alcohol, Isopropyl alcohol, n-butyl alcohol, a cyclohexanol, Ethylene glycol, propylene glycol, propylene glycol monomethyl ether, (Kuraray, a trade name PGM), and the propylene glycol monoethyl ether (Kuraray --) A trade name PE, propylene glycol tertiary butyl ether (Kuraray, trade name PTB), 3-methyl-3-methoxybutanol (Kuraray, trade name SORUFITTO), and dipropylene glycol monomethyl ether (Kuraray, trade name D-PGM) are mentioned.

[0050] As an ethers solvent, ethylene glycol monomethyl ether (methyl cellosolve), ethylene glycol monoethyl ether (ethylcellosolve), ethylene glycol monobutyl ether (butyl cellosolve), diethylene glycol monoethyl ether (ethyl carbitol), and the diethylene-glycol monobutyl ether (butyl carbitol) are mentioned. Tetrahydrofuran, N, and N-dimethyl formamide, dimethylacetamide, dioxane, chloroform, etc. can be used as other solvents.

[0051] In this case, as a polymerization initiator which can be used, 2 and 2'-azobis - (2-methyl butyronitrile), t-butylperoxy2-ethylhexanoate, etc. are mentioned. These polymerization initiators are preferably used in 0.1 - 10% of the weight of the range 0.05 to 20% of the weight to the AUW of a polymerization nature monomer. As an azo initiator, - azobisisobutyronitril (trade name azobisuisobutironitoriru and Japanese Hydrazine Industry), and 2 and 2'-azobis - (2-methyl butyronitrile) (trade name ABN-E and Japanese Hydrazine Industry), 2, and 2 '2, 2'-azobis (2,4-dimethylvaleronitrile) (trade name ABN-V and Japanese Hydrazine Industry) is mentioned. As a peroxide system initiator, it is benzoyl peroxide (trade name NAIPA BW and Nippon Oil & Fats Co., Ltd.), 1, and 1-screw (tert-butyl peroxide). - 3, 3, 5-trimethylcyclohexane (trade name par hexa 3M and Nippon Oil & Fats Co., Ltd.), and t-butylperoxy2-ethylhexanoate (trade name par butyl O and Nippon Oil & Fats Co., Ltd.) are mentioned. These polymerization initiators are preferably used in 0.1 - 10% of the weight of the range 0.05 to 20% of the weight to the AUW of a polymerization nature monomer. polymerization reaction temperature -- ordinary temperature - about 200 degrees C is about 40-140 degrees C preferably.

[0052] As a chain transfer agent, n-dodecyl mercaptan, tert-dodecyl mercaptan, n-butyl mercaptan, gamma-mercapto propyltrimethoxysilane, etc. are mentioned. These may be

used independently and may be used two or more sorts. As for the amount used, it is desirable that it is 0.1 - 10 % of the weight to the monomer whole quantity.

[0053] As an example of a chain transfer agent, as alkyl mercaptan n-butyl mercaptan, n-hexyl mercaptan, n octyl mercaptan, As mercaptans of n-dodecyl mercaptan, t-dodecyl mercaptan, a cetyl mercaptan, a stearyl mercaptan, and others Thioglycolic acid, the thioglycerol, an ethylene thioglycol, 2-ethylhexyl thioglycolate, 2-mercaptoethanol, a mercapto glycerol, mercaptosuccinic acid, Mercaptopropionic acid, other disulfide, Dimethylxanthogen disulfide, As secondary alcohol, isopropyl alcohol, dioxane, a tetrahydrofuran, isopropyl benzole, an alpha-methyl-styrene dimer, 2, 4-diphenyl-4-methyl-1-pentene, and a halogenated compound A carbon tetrachloride, chloroform, TORIKURORO bromoethane, bromoform, etc. are mentioned.

[0054] Although the target engine performance is obtained by preparing the above-mentioned acrylic polymer layer between an aluminum foil layer and an unstretched film layer, there is effectiveness which gives electrolytic-solution-proof nature and thermal resistance to this polymer layer by making it react with an isocyanate radical further, and making a bridge construct.

[0055] In this case, in order to make it react with an isocyanate radical, as a raw material of a polymer, a hydroxyl-group content polymerization nature monomer is an indispensable component, blends 3.5 - 23 % of the weight preferably at least 2.0 to 35% of the weight into a monomer component, and is taken as a copolymer. At the time of less than 2.0 % of the weight, the hydroxyl-group content in the polymer obtained decreases, reactivity with the poly isocyanate falls, crosslinking density becomes low and the adhesive ability made into the purpose is not obtained. The preservation stability exceeding 35 % of the weight on the other hand if abundant, after blending the poly isocyanate worsens. That is, if the polymer in the acrylic polymer layer of this invention is acrylic polyol, it can make a bridge construct with an isocyanate radical as mentioned above, and is a desirable operation gestalt. Specifically as acrylic polyol of this invention, at least one sort chosen from a hydroxyl-group content polymerization nature monomer is used.

[0056] If it is the poly isocyanate which has two or more isocyanate radicals in a molecule as a compound which has the isocyanate radical used for the above-mentioned processing, there will be especially no limit. For example, trimethylene diisocyanate, 1,6-hexamethylene diisocyanate, Tolylene diisocyanate, xylylene diisocyanate, diphenylmethane diisocyanate, The trimethylol propane adduct object which is a derivative of isophorone diisocyanate and these diisocyanate, A biuret object, an isocyanurate object D ax adduct poly isocyanate compound, Furthermore the block isocyanate compound which blocked the isocyanate radical of these isocyanate compounds with compounds, such as epsilon caprolactam, a phenol, cresol, an oxime, and alcohol, can be mentioned, and it can be used as one sort or two sorts or more of mixture.

[0057] In this case, to 1Eq of hydroxyl groups in a polymer, as an isocyanate radical of the poly isocyanate compound, it blends, and a bridge is constructed and 0.5-2.0Eq 0.8-1.5Eq is used preferably. In order to promote the urethane-ized reaction of this hydroxyl group and an isocyanate radical, it is desirable to use an organic tin compound or tertiary amines, such as a well-known catalyst, for example, dilauryl acid di-n-butyl tin etc., etc. In addition, it faces applying the obtained polymer to aluminium foil, and various additives for coatings, such as an organic solvent, a filler, a leveling agent, a plasticizer, a stabilizer, a color, and a pigment, can also be blended suitably.
[0058] Although laminating configurations, such as aluminium foil of the wrapping material for electronic-parts cases of this invention and a film, may have a heat-resistant-resin oriented film in the both sides of aluminium foil, in order that carrying out a laminating to the outer layer (opposite side of the unstretched film layer of aluminium foil) of an wrapping material with direct adhesives at least may lessen the opportunity of fracture by necking of aluminium foil, they are required. the spreading coat of the acrylic polymer layer is carried out as a solution between aluminium foil and a thermoplastics unstretched film layer -- it is -- it is -- a melt coat is carried out -- it is -- it is -- it prepares by carrying out dry laminate of the film of this resin etc.
[0059] While a thermoplastics unstretched film is prepared in the innermost layer (it becomes inside a case when it considers as a cell case) of an wrapping material through an acrylic polymer layer and gives heat-sealing nature to the wrapping material for electronic-parts cases, in order to secure the chemical resistance of a case, the laminating of it must be carried out. In these laminatings, to laminate heat-resistant-resin oriented films, such as a polyamide film, it is required dry laminate adhesives and to carry out a laminating preferably using urethane system dry laminate adhesives. When thermoplastics unstretched films, such as polyethylene, polypropylene, an ethylene-acrylate copolymer (EAA), and ionomer resin, are laminated in aluminium foil, it laminates using an acrylic polymer layer.
[0060] Although the wrapping material for electronic-parts cases of this invention is based also on the size of a cell or a capacitor, since the wrapping material total thickness is held down to 150 micrometers or less and the purpose can be enough attained combining a polymer layer, a thermoplastics unstretched film, etc. which usually consist of a heat-resistant-resin oriented film, aluminium foil, and acrylic polyol (also including dry laminate), as for the thickness beyond it, avoiding is efficiently desirable. Making wrapping material total thickness thick beyond the need reduces a volume energy consistency.
[0061] Since a fabricating [with sufficient productivity / efficiently]-by deep-drawing shaping [between the colds] or stretch forming-electronic-parts case thing was made and the closure was also made with heat sealing when using the wrapping material for electronic-parts cases of this invention, shaping of the electronic-parts case of a sharp configuration was attained using the thin ingredient, without needing an excessive area

for the closures conventionally needed for the closure, and the volume. For this reason, the high cell and high capacitor of volume energy density and weight energy density were able to be created. It is not necessary to limit especially as the manufacture approach of a cell case, and can usually fabricate according to a process. Since the stacking tendency of the oriented film by heating at the time of shaping is spoiled since it can fabricate and does not heat, or there is no risk of DERAMI [the aluminium foil and the heat-resistant-resin oriented film based on the heat shrink of an oriented film] between the colds (ordinary temperature), it is sharp and the cell case where reinforcement is high can be fabricated. In addition, when required shaping height is high, it fabricates using the multistage fabricating method.

[0062] Furthermore, since the wrapping material for electronic-parts cases of this invention has little directivity of a mechanical property, when the shaping height of stretch forming or deep-drawing shaping is low (5mm or less), it has the description which can be fabricated by non-lubrication. In addition, since this wrapping material for electronic-parts cases is excellent in heat-sealing nature, chemical resistance, a moldability, etc., it is an wrapping material available also as a charge of container material for the contents not only containing the object for cell cases but strong contents or a strong organic solvent a chemical and corrosive [for drugs cosmetics, and photographs / other].

[0063]

[Example] Although an example and the example of a comparison explain this invention to a detail further, this invention is not limited at all by these. In addition, the "section" given in an example and the example of a comparison shows the "weight section", and shows "% of the weight""%."

[0064] [Inside adhesives] (acrylic polymer)

(Example 1) The ethyl-acetate 55 section was taught as a solvent to the 4 opening flask furnished with a thermometer, a nitrogen gas installation official, a dropping funnel, a condensator, and an agitator, and the temperature up was carried out to 80 degrees C. On the other hand, it is 4-methacryloyloxy as a hindered amine radical content polymerization nature monomer. - as the 2, 2, 6, and 6-tetramethylpiperidine 3 section and a cycloalkyl radical content polymerization nature monomer 2-[2'-hydroxy-5'-(methacryloiloxy-ethyl) phenyl]-2H-benzotriazol (it is written as "benzotriazol (A)" below.) As the one section, the hydroxyethyl methacrylate 5 section, and other polymerization nature monomers as the butyl methacrylate 30 section, the methacrylic-acid 0.5 section, the butyl acrylate 20.5 section, and a polymerization initiator -- 2 and 2'-azobisisobutyronitril (the following -- an "initiator" and ****** --) Being dropped over 2 hours at 80 degrees C, and holding at 80 more degrees C having put the mixed liquor which mixed the 0.5 sections into the dropping funnel, and stirring under a nitrogen gas air current, it stirred for 4 hours and copolymerization was carried out.

[0065] Subsequently, only the amount from which the equivalent ratio of an isocyanate radical to the hydroxyl group of this copolymer is set to 1:1 extracted and blended the polyfunctional isocyanate (Sumi Joule N-3200; the Sumitomo Bayer urethane incorporated company make) as a cross linking agent, ethyl acetate was further added and diluted in this copolymer solution, and viscosity was adjusted to it. After applying and carrying out the forced drying of the obtained mixed liquor to aluminium foil for 100 degree-Cx 20 seconds, it stuck with CPP or an ionomer film, and considered as the test piece. With the compounding ratio shown in Table 1, the acrylic polymer was compounded like the example 1, subsequently polyfunctional isocyanate was blended, and it considered as the test piece.

[0066] (Examples 1-6, example 1 of a comparison)

(Wrapping material for electronic-parts cases) the aluminium foil (AA Standard 8079, O material) of aluminum-iron system alloys, such as a heat-resistant-resin oriented film, a thermoplastics unstretched film, etc. which are shown below, -- using -- as the adhesives for external surface -- urethane system dry laminate adhesives [-- the adhesives which consist of an acrylic polymer considering Oriental Morton, Inc.:AD502/CAT10] as adhesives for insides were used.

[0067] In addition, the following cable addresses are used.

As for 1.4 directions, the **** direction means a direction (0 degree, 45 degrees, 90 degrees, and 135 degrees) to the one direction of arbitration.

2. Aluminum : Aluminium Foil [0068]

ON** : 3. Polyamide Film [tensile strength : 4 direction =250N/mm2 and 265N/mm2, mm 250Ns /2 and 245-N[/mm]2], [-- **** elongation: -- 4 direction (162%, 140%, 153%, 155%)] -- a 4.ON**:polyamide film [tensile strength: 4 direction =188N/mm2, 235N/mm2, 215N/mm2, and 195-N[/mm]2] [**** elongation: 4 direction (121%, 86%, 99%, 89%)]

5. ON** : Polyamide Film [Tensile Strength: 4 Direction =168N/Mm2, 135N/Mm2, 151N/Mm2, and 144-N[/Mm]2] [**** Elongation: 4 Direction (112%, 66%, 89%, 67%)]

[0069]

6. PET ** : Polyester Film [Tensile Strength: 4 Direction =220N/Mm2, 245N/Mm2, 265N/Mm2, and 221-N[/Mm]2] [**** Elongation: 4 Direction (122%, 90%, 105%, 98%)]

7. LLDPE: -- Line -- Low Consistency Polyethylene Film [0070] 8. CPP : Non-Extended Polypropylene Film 9.IO : Ionomer Resin Film 10. Dry Cleaning: Adhesives for External Surface (Urethane System Adhesives)

The configuration of the monomer of the acrylic polymer layer prepared between aluminium foil and an unstretched film layer is shown in Table 1.

[0071]

[Table 1]

	ポリマー接着剤						接着剤
	実施例１及び実施例７	実施例２	実施例３	実施例４	実施例５	実施例６	比較例１
	接着剤１	接着剤２	接着剤３	接着剤４	接着剤５	接着剤６	接着剤７
4−ﾒﾀｸﾛｲﾙｵｷｼ−2,2,6,6−ﾃﾄﾗﾒﾁﾙﾋﾟﾍﾟﾘｼﾞﾝ(a)	３	０．５	−−	−−	１	１	ドライラミネート用ウレタン系接着剤
シクロヘキシルメタクリレート(b)	４０	３０	３０	−−	３０	３０	
2−［2'ﾋﾄﾞﾛｷｼ−5'−(ﾒﾀｸﾘｵﾘﾙｵｷｼｴﾁﾙ)ﾌｪﾆﾙ］−2H−ﾍﾞﾝｿﾞﾄﾘｱｿﾞｰﾙ(c)	１	−−	−−	−−	０．５	１	
ヒドロキシエチルメタクリレート	５	１０	１０	１０	２	１	
ブチルメタクリレート	２０	２０	２０	２０	２６	２６	
メタクリル酸	０．５	０．５	０．５	０．５	０．５	０．５	
ブチルアクリレート	３０．５	３９	３９．５	３９．５	４０	４０．５	
メチルメタクリレート	−−	−−	−−	３０	−−	−−	

[0072]

(Configuration of a laminate material)

Example 1: The ON**25-/dry cleaning / aluminum40/adhesives 1/CPP30 (wrapping-material total thickness: 100 micrometers)

Example 2: 2/of ON**25-/dry cleaning / aluminum40/adhesives IO 50 (wrapping-material total thickness: 120 micrometers)

Example 3: The ON**25-/dry cleaning / aluminum40/adhesives 3/CPP30 (wrapping-material total thickness: 100 micrometers)

Example 4 :P The ET**16-/dry cleaning / aluminum40/adhesives 4/CPP30 (wrapping-material total thickness: 91 micrometers)

Example 5: The ON**25-/dry cleaning / aluminum40/adhesives 5/CPP30 (wrapping-material total thickness: 100 micrometers)
Example 6 :P The ET**16-/dry cleaning / aluminum40/adhesives 6/CPP30 (wrapping-material total thickness: 91 micrometers)
Example 7: 1/of ON**25-/dry cleaning / aluminum40/adhesives LLDPE 30 (wrapping-material total thickness: 100 micrometers)
[0073]
Example [of a Comparison] 1: The-**25/dry cleaning / aluminum40/adhesives 7/CPP30 (wrapping-material total thickness: 100 micrometers)
[0074] (The evaluation approach of a moldability) the above-mentioned wrapping material for electronic-parts cases -- a 110mmx180mm blank configuration -- carrying out -- shaping height -- it ****ed with free straight metal mold, one-step shaping was performed, and the shaping height of each wrapping material compared the moldability. The thing of 60mm of long sides, 45mm of shorter sides, corner R =1-2mm, R= 1mm of punch shoulders, and R= 0.5mm of dice shoulders was used for the punch configuration of the used metal mold. A result is shown in Table 1.
[0075] (The seal nature evaluation approach) The electrolytic solution (dimethyl carbonate + ethyl carbonate (DMC:EC=1:1) + lithium salt) was poured into the square shape container fabricated by the aforementioned approach, the container was inverted after heat sealing, it saved during January at 60 degrees C, and the existence of seal leakage was checked. A result is shown in Table 2.
(The steam permeability evaluation approach) After filling up with and carrying out the seal of the cell to the square shape container fabricated by the aforementioned approach, it saved for seven days 60 degreex90% in the environment of RH, and the moisture content in the electrolytic solution was measured with the Karl Fischer technique. A result is shown in Table 2.
(The electrolytic-solution-proof nature evaluation approach) The lamination reinforcement after immersion was measured in ordinary temperature on the 7th to the electrolytic solution (dimethyl carbonate: ethyl carbonate =1:1+Li salt).
[0076]
[Table 2]

	成形高さ		シール性	水蒸気	耐電解液
	コーナーR2	コーナーR1	漏れの有無	透過性	性
実施例1	◎	○	漏れなし	◎	○
実施例2	○	△	漏れなし	◎	○
実施例3	○	△	漏れなし	◎	○
実施例4	○	△	漏れなし	○	○
実施例5	○	△	漏れなし	◎	○
実施例6	○	△	漏れなし	◎	△
実施例7	◎	○	漏れなし	◎	○
比較例1	×	×	漏れなし	×	△

[0077] However, the criteria of evaluation are shown in Table 3.
[Table 3]

評価	成形性	水蒸気透過性	耐電解液性
◎	5mm以上	50ppm以下	ﾗﾐﾈｰﾄ強度 変化なし
○	3～5mm	50～100ppm	ﾗﾐﾈｰﾄ強度 保持率60% 以上
△	2～3mm	100～300ppm	ﾗﾐﾈｰﾄ強度 保持率30%以上
×	2mm未満	300ppm以上	ﾗﾐﾈｰﾄ強度 デラミネート

[0078]
[Effect of the Invention] This invention is excellent in the workability of stretch forming, deep-drawing shaping, etc., and shaping of a sharp configuration is possible for it. Have the engine performance high also in reinforcement and the adhesive property of aluminium foil and a resin layer is also high. It excels in waterproof steamy permeability, electrolytic-solution-proof permeability, a moldability, and heat-sealing nature. As a result of inquiring wholeheartedly that the wrapping material for electronic-parts cases which is not invaded by the corrosive electrolytic solution etc. should be developed, by preparing an acrylic polymer layer between an aluminum foil layer and an unstretched film layer The purpose is attained, the polymer which has at least one sort of organic radicals chosen from the hindered amine radical, cycloalkyl radical, and benzotriazol radical which have further specific structure finds out that remarkable effectiveness is shown, and it came to complete this invention. While preventing necking fracture of aluminium foil effectively at the time of press working of sheet metal by having prepared the acrylic polymer layer especially for the heat-resistant-resin oriented film in the outer layer between aluminium foil and a thermoplastics unstretched film layer, the high cell case of waterproof steamy permeability, electrolytic-solution-proof permeability, a moldability, heat-sealing nature, a mechanical strength, elevated-temperature shelf life, and chemical resistance can

manufacture easily. Volume energy density and weight energy density can use both the electronic-parts cases using this wrapping material for electronic-parts cases as capacitor cases, such as a case for secondary batteries efficient high very, and an electric double layer capacitor, etc.

[Translation done.]